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# THE WILD FLOWERS OF AMERICA

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# Wisdom, Kindness and Appreciation.

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THE most precious attribute in man is wisdom or common sense. Brilliancy pales before it. In every walk of life there is brought home to us every day the value of wisdom. There are people in the world who outstrip their neighbors and competitors in every rivalry. They look at things with keener appreciation; they know things better and as it were by instinct. These people are generally credited with wisdom. They usually have knowledge. If an invention of striking value comes out they secure it. If a book of surpassing merit is issued they buy it, and the sum of it all is, these people get ahead and the others don't know why. The way the knowing ones are buying the portfolios of "WILD FLOWERS OF AMERICA" is the latest instance, striking and convincing. These people know just as well as if they saw the tangible evidence that they will never have an opportunity to get these portfolios at the nominal figure for which they are now securing them, and the consequence is the wise of both sexes and all ages who know about them are buying them. That's Wisdom.

## KINDNESS.

Next to Wisdom and a beautiful companion for it—is Kindness. There are tens of thousands who have not had the opportunity of seeing the announcements of the Wild Flower portfolios, and would have missed them entirely had it not been for the KINDNESS of others telling and writing to friends, informing them how and where they can get them. Thousands of these are cutting out coupons and sending them to friends. Isn't this KINDNESS? It is kindness that will be appreciated more and more as the years roll by, when many a man and woman will be heard to say, "I would not have had the 'Wild Flowers of America' if it had not been for my good friend ———." Kindness endureth. Perhaps some others will let their friends know that for a short, short time back numbers of "Wild Flower" portfolios may be procured through the same medium.

## APPRECIATION.

Here follow a few extracts from letters received giving evidence of appreciation. And so this great work is passing on, and millions will lament the lost opportunity when it is too late.

"Wild Flowers of America" fill a long-felt want.

**Amos J. Cummings,**
*U. S. Congressman.*

"Wild Flowers of America" carried out with the enthusiasm of a botanist and the skill of an artist. **Professor W. Wilson,**
*Chairman U. S. Committee Ways and Means.*

Nothing that has come under my notice is to be compared with the "Wild Flowers of America," by G. H. Buek & Co.

**W. T. Harris,**
*Chairman U. S. Bureau Education, Washington.*

"Wild Flowers of America" for the first time places the native flowers of the United States within the reach of every man, woman and child of our land. **Amos J. Cummings.**

Regarding "Wild Flowers of America," by G. H. Buek & Co., while there are a number of works in which a few of our more conspicuous plants are figured, there is none so far as I know that is so exhaustive as this. **Professor F. H. Knowlton,**
*Department of Botany, Smithsonian Institution, Washington.*

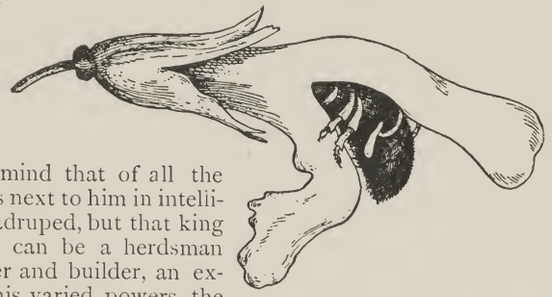
"Wild Flowers of America," by G. H. Buek & Co., is a happy idea.

**Professor W. Wilson,**
*Chairman U. S. Committee Ways and Means, Washington.*

# The Strange Story of the Flowers.

## Dress Counts for Much. To Catch Dust on One's Clothes is More Than to Carry Brains in One's Head.

Imagine a Venetian doge, a French crusader, a courtier of the time of the second Charles, an Ojibway chief, a Justice of the Supreme Court, in the formal black of evening dress, and how much each of them would lose! Where there is beauty, strength or dignity, dress can heighten it; where all these are lacking, their absence is kept out of mind by raiment in itself worthy to be admired. If dress artificial has told for much in the history of human-kind, dress natural has told for yet more in the lesser world of plant and insect life. In some degree the tiny folk that reign in the air, like ourselves, are drawn by grace of form, by charm of color; of elaborate display of their attractions moths, butterflies and beetles are just as fond as any belles of the ball-room. Now let us bear in mind that of all the creatures that share the earth with man, the one that stands next to him in intelligence is neither a biped nor a quadruped, but that king of the insect tribe, the ant, which can be a herdsman and warehousekeeper, an engineer and builder, an explorer and a general. With all his varied powers the ant lacks a peculiarity in his costume which has denied him enlistment in a task of revolution in which creatures far his inferiors have been able to change the face of the earth. And the marvel about this peculiarity of garb which has meant so much is that it consists in no detail of graceful outline, or beauty of tint, but solely in the minor matter of texture. The ant, warrior that he is, wears smooth and shining armor; the bee, the moth and the butterfly are clad in downy vesture, and simply because thus enabled to catch dust on their clothes these insects, as weavers of the web of life, have counted for immensely more than the ant with all his brains and character. To understand the mighty train of consequences set in motion by this mere shagginess of coat, let us remember that, like a human babe, every flowering plant has two parents. These two parents, though a county's breadth divide them, are wedded the instant that pollen from the anther of one of them meets the stigma of the other. Many flowers find their mates upon their own stem; but, as in the races of animals, too close intermarriage is hurtful, and union with a distant stock promotes both health and vigor. Hence the great gain which has come to plants by engaging the wind as their match-maker,—as every summer shows us in its pollen-laden air, the oaks, the pines, the cottonwoods, and a host of other plants commit to the breeze the winged atoms charged with the continuance of their kind. Nevertheless, long as the wind has been employed at this work, it has not yet learned to do it well; nearly all the pollen entrusted to it is wasted, and this while its production draws severely upon the strength of a plant. As good fortune will have it, a great many flowers close to their pollen yield an ample supply of nectar: a food esteemed delicious by the whole round of insects winged and wingless. While ants might sip this nectar for ages without plants being any the better or the worse, a very different result has followed upon the visits of bees, wasps, and other hairy-coated callers. These, as they devour nectar, dust themselves with the pollen near by. Yellowed or whitened with this freightage, moth and butterfly as they sail through the air know not that they are publishing the banns of marriage between two blossoms acres or, it may be, miles apart. Yet so it is. Alighting on a new flower the insect rubs a pollen grain on a stigma ready to receive it, and lo! the rites of matrimony are solemnized then and there. Unwittingly the little visitor has wrought a task bigger with fate than many an act loudly trumpeted among the mightiest deeds of men! In our illustration of the Lady's Slipper a bee is detected in the act of entrance. In the Sage-flower he finds an anther of the stamen which, pivoted on its spring, dusts him even more effectually.



Sage-flower and bee.

Lady's Slipper and bee entering for nectar and pollen.

### Inn and Inn-sign.

Bountifully to spread a table is much, but not enough, for without invitation how can hospitality be dispensed? To the feast of nectar the blossoms join their bidding; and those most conspicuously borne and massed, gayest of hue, richest in odor, secure most guests, and are therefore most likely to transmit to their kind their own excellences as hosts and entertainers. Thus all the glories of

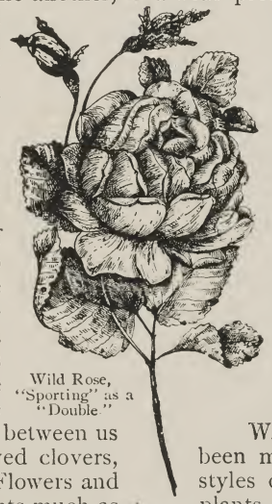
Sage-flower—Anther of stamen tilted by visiting bee.

the blossoms have arisen in doing useful work; their beauty is not mere ornament, but the sign and token of duty well performed. Our opportunity to admire the radiancy and perfume of a jessamine or a pond-lily is due to the previous admiration of uncounted winged attendants. If a winsome maid adorns herself with a wreath from the garden, and carries a posy gathered at the brookside, it is for the second time that their charms are impressed into service; for the flowers' own ends of attraction all their scent and loveliness were called into being long before.

Wild Rose, Single.

Let us put flowers of the Blue Flag beside those of the maple, and we shall have a fair contrast between the brilliancy of blossoms whose marrier has been an insect, and the dinginess of flowers indebted to the services of the wind. Can it be that both kinds of flowers are descended from forms resembling each other in want of grace and color? Such indeed is the truth. But how, as the generations of the flowers succeeded one another, did differences so striking come about? In our rambles afield let us seek a clue to the mystery. It is late in springtime, and near the border of a bit of swamp we notice a clump of violets: they are pale of hue, and every stalk of them rises to an almost weedy height.

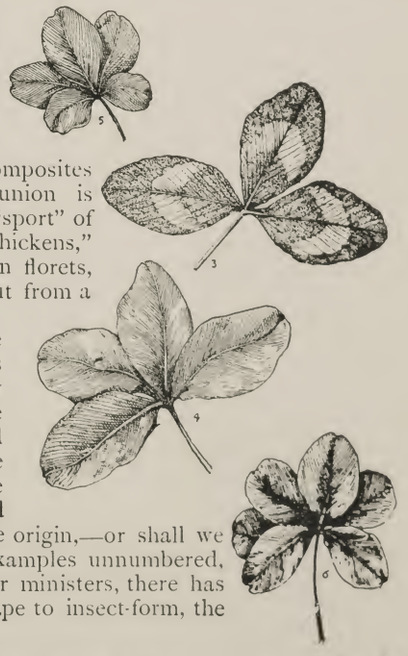
Twenty paces away, on a knoll of dry ground, we find more violets, but these are in much deeper tints of azure and yellow, while their stalks are scarcely more than half as tall as their brethren near the swamp. Six weeks pass by. This time we walk to a wood-lot close to a brimming pond. At its edge are more than a score wild-rose bushes. On the very first of them we see that some of the blossoms are a light pink, others a pink so deep as to seem dashed with vivid red. And while a flower here and there is decidedly larger and more vigorous than its fellows, a few of the blossoms are undersized and puny: the tide of life flows high and merrily in a fortunate rose or two, it seems to ebb and falter by the time it reaches one or two of their unhappy mates. As we search bush after bush we are at last repaid for sundry scratches from their thorns by securing a double rose, a "sport," as a gardener would call it. And in the broad meadow between us and home we well know that for the quest we can have not only four-leaved clovers, but perchance a handful of five and six-leaved prizes. The secret is out. Flowers and leaves are not cast like bullets in rigid molds, but differ from their parents much as children do. Usually the difference is slight, at times it is as marked as in our double rose. Whenever the change in a flower is for the worse, as in the sickly violets and roses we have observed, that particular change ends there—with death. But when the change makes a healthy flower a little more attractive to its insect ministers, it will naturally be chosen by them for service, and these choosings, kept up year after year, and century upon century, have at last accomplished much the same result as if the moth, the bee, and the rest of them had been given power to create blossoms of the most welcome forms, the most alluring tints, the most bewitching perfumes.



Wild Rose, "Sporting" as a "Double"

## Relapse Into Old Habits.

In farther jaunts afield we shall discover yet more. It is May and a heavy rainstorm has caused the petals of a trillium to forget themselves and return to their primitive hue of leafy green. A month later we come upon a buttercup, one of whose sepals has grown out as a small but perfect leaf. Later still in summer we find a rose in the same surprising case, while not far off is a columbine bearing pollen on its spurs instead of its anthers. What family tie is betrayed in all this? No other than that sepals, petals, anthers and pistils are but leaves in disguise, and that we have detected nature returning to the form from which ages ago she began to transmute the parts of flowers in all their teeming diversity. The leaf is the parent not only of all these but of the delicate tendrils which save a vine the cost of building a stem stout enough to lift it to open air and sunshine. However thoroughly, or however long, a habit may be impressed upon a part of a plant, it may on occasion relapse into a habit older still, resume a shape all but forgotten, and thus tell a story of its past that otherwise might remain for ever unsuspected. Thus is it with the somewhat rare "sport" that gives us a morning glory or a harebell in its primitive form of unjoined petals. The bell form of these and similar flowers has established itself by being much more effective than the original shape in dusting insect servitors with pollen. Not only the forms of flowers but their massing has been determined by insect preferences; a wide profusion of blossoms grow in spikes, umbels, racemes and other clusters, all economising the time of winged allies, and attracting their attention from afar as scattered blossoms would fail to do. Besides this massing, we have union more intimate still as in the dandelion, the sunflower and the marigold. These and their fellow composites each seem an individual; a penknife discloses each of them to be an aggregate of blossoms. So gainful has this kind of co-operation proved that composites are now dominant among plants in every quarter of the globe. As to how composites grew before they learned that union is strength, a hint is dropped in the "sport" of the daisy known as "the hen and chickens," where perhaps as many as a dozen florets, each on a stalk of its own, lay out from a mother flower.



Clover, with four, five and six-leaved sports.

While for the most part insects have been mere choosers from among various styles of architecture set before them by plants, they have sometimes risen to the dignity of builders on their own account, and without ever knowing it. The buttress of the larkspur has sprung forth in response to the pressure of one bee's weight after another, and many a like structure has had the very same origin,—or shall we say, provocation? In these and in other examples unnumbered, culminating in the marvellous orchids and their ministers, there has come about the closest adaptation of flower-shape to insect-form, the one now clearly the counterpart of the other.

### If Thou Wilt Not Work, Neither Shalt Thou Eat.

We must not forget that the hospitality of a flower is after all the hospitality

of an inn-keeper who earns and requires payment. Vexed as flowers are apt to be by intruders that consume their stores without requital, no wonder that they present so ample an array of repulsion and defence. Best of all is such a resource as that of the red clover, which hides its honey at the bottom of a tube so deep that only a friendly bumblebee can sip it. Less effective, but well worth a moment's examination, are the methods by which leaves are opposed as fences for the discouragement of thieves. Here, in a Bellwort, is a perfoliate leaf that encircles the stem upon which it grows; and there in a Honeysuckle, is a connate leaf, on much the same plan, formed of two leaves, stiff and strong, soldered at their bases. Sometimes the pillager meets prickles that sting him, as in the roses and briers; and if he is a little fellow he is sure to regard with intense disgust a bristly guard of wiry hair—hence the commonness of that kind of fortification. Against enemies of larger growth a tree or shrub will often arm sharp thorns—another piece of masquerade, for thorns are but branches checked in growth, and frowning with a barb in token of disappointment at not being able to smile in a blossom. In every jot and tittle of barb or prickle, of the glossiness which disheartens or the gumminess which ensnares, we may be sure that equally with all the lures of hue, form and scent, nothing, however trifling it may seem, is as we find it except through usefulness long tested and approved. In flowers, much that at a first glance looks like idle decoration, on closer scrutiny reveals itself as service in disguise. In penetrating these disguises and many more of other phases, the student of flowers delights to busy himself. He loves, too, to detect the cousinship of plants through all the change of dress and habit due to their rearing under widely different skies and nurture, to their being surrounded by strangely contrasted foes and friends. Often he can link two plants together only by going into partnership with a student of the rocks, by turning back the records of the earth until he comes upon a flower long extinct, a plant which ages ago found the struggle for life too severe for it. He ever takes care to observe his flowers accurately and fully, but chiefly that he may rise from observation to explanation, from bare facts to their causes, from declaring What to understanding Whence and How.

Buttercup with a sepal growing as a leaf.

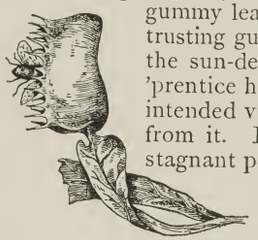
Venus' Fly Trap—Open with a Welcome!

### The Inn-Keeper Turns Slayer.

One of the stock resources of novelists, now somewhat out of date, was the inn-keeper who beamed in welcome of his guest, grasped his hand in gladness, and loaded a table for him in tempting array, and all with intent that later in the day (or night) he might the more securely plunge a dagger into his victim's heart—if, indeed, he had not already improved an opportunity to offer to that victim's lips a poisoned cup. This imagined treachery might well have been suggested by the behaviour of certain alluring plants that so far from repelling thieves, or discouraging pillagers, open their arms to all comers—with purpose of the deadliest. Of these betrayers the chief is the round-leaved sun-dew, which plies its nefarious vocation all the way from Labrador to Florida. Its favorite site is a peat-bog or a bit of swampy low-land, where in July and August we can see its pretty little white blossoms beckoning to wayfaring flies and moths their token of good cheer! Circling the flower-stalk, in rosette fashion, are a dozen or more round leaves, each of them wearing scores of glands, very like little pins, a drop of gum glistening on each and every pin by way of head. This appetizing gum is no other than a fatal stick-fast, the raying pins closing in its aid the more certainly to secure a hapless prisoner. Soon his prison house becomes a stomach for his absorption. Its duty of digestion done, the leaf in all seeming guilelessness once more expands itself for the enticement of another dupe. To see how much the sun-dew must depend upon its meal of insects we have only to pull it up from the ground. A touch suffices—it has just root enough to drink by; the soil in which it makes, and perhaps has been obliged to make, its home has nothing else but drink to give it.

Columbine with spurs instead of anthers bearing its pollen

Less accomplished in its task of assassination is the common butterwort to be found on wet rocks in scattered districts of Canada and the States adjoining Canada. Surrounding its pretty violet flowers, of funnel shape, are gummy leaves which close upon their all too trusting guests, but with less expertness than the sun-dew's. The butterwort is but a 'prentice hand in the art of murder, and its intended victims often manage to get away from it. Built on a very different model is the bladderwort busy in stagnant ponds near the sea coast from Nova Scotia to Texas. Its little white spongy bladders, about a tenth of an inch across, encircle the flowering stem by scores. From each bladder a bunch of twelve or fifteen hairy prongs protrude, giving the structure no slight resemblance to an insect form. These prongs hide a valve which, as many an unhappy little swimmer can attest, opens inward easily enough, but opens outward never. As in the case of its cousinry a-land, the bladderwort at its leisure dines upon its prey.



Shut for Slaughter!

In marshy places near the mouth of the Cape Fear River, in the vicinity of Wilmington, North Carolina, grows the Venus' fly-trap, most wonderful of all the death-dealers of vegetation. Like much else in nature's handiwork this plant might well have given inventors a hint worth taking. The hairy fringes of its leaves are as responsive to a touch from moth or fly as the sensitive plant itself. And he must be either a very small or a particularly sturdy little captive that can escape through the sharp opposed teeth of its formidable snare. It is one of the unexplained puzzles of plant life that the Venus' fly-trap, so marvellous in its ingenuity, should not only be confined to a single district, but should seem to be losing its hold of even that small kingdom. Of still another type is the pitcher plant, or side-saddle flower, which flaunts its deep purple petals in June in many a peat-bog from Canada southward to Louisiana and Florida. Its leaves develop themselves into lidded cups, half filled with sweetish juice, which first lures a fly or ant, then makes him tipsy, and then despatches him. The broth resulting is both meat and drink to the plant, serving as a store and reservoir against times of drought and scarcity.

## Plants as Learners.

Now the question is, How came about this strange and somewhat horrid means of livelihood? How did plants of so diverse families turn the tables on the insect world, and learn to eat instead of being themselves devoured? A beginner in the builder's art finds it much more gainful to examine the masonry of foundations, the rearing of walls, the placing of girders and joists, the springing of arches and buttresses, than to look at a cathedral, a court house, or a bank, finished and in service. In like manner a student of insect-eating plants tries to find their leaves in the making, in all the various stages which bridge their common forms with the shapes they assume when fully armed and busy. Availing himself of the relapses into old habits which plants occasionally exhibit under cultivation, Mr. Dickson has taught us much regarding the way the pitcher plant of Australia, the *Cephalotus*, has come to be what it is. He has arranged in a connected series all the forms of its leaf from that of a normal leaf with a mere dimple in it, to the deeply pouched and lidded pitcher ready for deceitful hospitalities. And similar transformations have without doubt taken place in the pitcher plants of America. Observers in the Cape of Good Hope have noted two plants *Roridula dentata and Biblys gigantea*, which are evidently following in the footsteps of the sun-dews, and may be expected in the fulness of years to be their equal partners in crime. But why need we wander so far as Southern Africa to find the germs of this strange rapacity when we can see at home a full dozen species of catch-fly, sedums, primulas, and geraniums pouring out glutinous juices in which insects are entangled? Let stress of hunger, long continued, force any of these to turn its attention to the dietary thus proffered, and how soon might not the plant find in felony the sustenance refused to honest toil?

Pitcher Plant and Flower.

## Picking and Choosing.

But after all the plants that have meat for dinner are only a few. The greater part of the vegetable kingdom draws its supplies from the air and the soil. Those plants, and they are many, that derive their chief nourishment from the atmosphere have a decidedly thin diet. Which of us would thrive on milk at the rate of a pint to five hogsheads of water? Such is the proportion in which air contains carbonic acid gas, the main source of strength for many thousands of trees, shrubs, and other plants. No wonder that they array themselves in so broad an expanse of leafage. An elm with a spread of seventy feet is swaying in the summer breeze at least five acres of foliage as its lungs and stomach. Beyond the shade of elms and maples let us stroll past yonder stretch of pasture and we shall notice how the grass in patches here and there deepens into green of the richest—a plain token of moisture in the hollows—a blessing indeed in this dry weather. In the far west and north-west the buffalo grass has often to contend with drought for months together, so that it has learned to strike deep in quest of water to quench its thirst. It is a by-word among the ranchmen that the roots go clear through the earth and are clinched as they sprout from the ground in China. Joking apart, they have been found sixty-eight feet below the surface of the prairie, and often in especially dry seasons cattle would perish were not these faithful little well-diggers and pumpers constantly at work for them. In the river valleys of Arizona although the air is dry the subsoil water is near the surface of the ground. Here flourishes the mesquit tree, *Prosopis juliflora*, with a tale to tell well worth knowing. When a mesquit seems stunted, it is because its strength is withdrawn for the task of delving to find water; where a tree grows tall with goodly branches, it betokens success in reaching moisture close at hand. Thus in shrewdly reading the landscape a prospector can choose the spot where with least trouble he can sink his well. And plants discover provender in the soil as well as drink. Nearer home than Arizona we have only to dislodge a beach pea from the ground to see how far in search of food its roots have dug amid barren stones and pebbles. Often one finds a plant barely a foot high with roots extending eight feet from its stem.

Dandelion Seeds ready for flight.

Maple Seed, with pair of wings.

And beyond the beaches where the beach peas dig so diligently are the seaweeds—with a talent for picking and choosing all their own. Dr. Julius Sachs, a leading German botanist, believes that the parts of plants owe their form, as crystals do, to their peculiarities of substance; that just as salt crystallizes in one shape and sugar in another, so a sea-weed or a tulip is moulded by the character of its juices. Something certainly of the crystal's faculty in picking out particles akin to itself, and building with them, is shown by the kelp which attracts from the ocean both iodine and bromine—often dissolved though they are in a million times their bulk of sea-water. This trait of choosing this or that dish from the feast afforded by sea or soil or air is not peculiar to the sea-weeds, every plant displays it. Beech trees love to grow on limestone and thus declare to the explorer the limestone ridge he seeks. In the Horn silver mine, of Utah, the zinc mingled with the silver ore is betrayed by the abundance of the zinc violet, a delicate and beautiful cousin of the pansy. In Germany this little flower is admittedly a signal of zinc in the earth, and zinc is found in its juices. The late Mr. William Dorn, of South Carolina, had faith in a bush, of unrecorded name, as betokening gold-bearing veins beneath it. That his faith was not without foundation is proved by the large fortune he won as a gold miner in the Blue Ridge country—his guide the bush aforesaid. Mr. Rossiter W. Raymond, the eminent mining engineer of New York, has given some attention to this matter of "indicative plants." He is of opinion that its unwritten lore among practical miners, prospectors, hunters and Indians is well worth sifting. Their observations, often faulty, may occasionally be sound and valuable enough richly to repay the trouble of separating truth from error. When we see how important as signs of water many plants can be, why may we not find other plants denoting the minerals which they especially relish as food or condiment?

## The Land as a Larder.

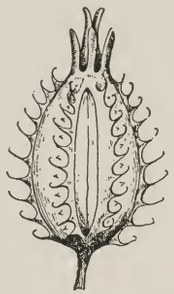
Of more account than gold or silver are the harvests of wheat and corn that ripen in our fields. There the special appetites of plants have much more than merely curious interest for the farmer. He knows full well that his land is but a larder which serves him best when not part but all its stores are in demand. Hence his crop "rotation," his succession of wheat to clover, of grass to both. Were he to grow barley every year he would soon find his soil bared of all the food that barley asks, while fare for peas or clover stood scarcely broached. If he insists on planting

barley always, then he must perforce restore to the land the food for barley constantly withdrawn.

### A Vigorous Emigration Policy.

Epilobium Seed with feathered wing

A plant may diligently find food and drink, pour forth delicious nectar, array itself with flowers as gaily as it can, and still behold its work unfinished. Its seed may be produced in plenty, and although as far as that goes it is well, it is not enough. Of what avail is all this seed if it falls as it ripens upon soil already overcrowded with its kind? Hence the vigorous emigration policy to be observed in plants of every name. Hence the fluffy sails set to catch the passing breeze by the dandelion, the thistle and by many more, including that southern plant of snowy wealth whose wings are cotton. With the same intent of seeking new fields are the hooks of the burdock, the unicorn plant and the bur-parsley which impress as carriers the sheep and cattle upon a thousand hills. The Touch-me-not and the herb Robert adopt a different plan, and convert their seed-cases into pistols for the firing of seeds at as wide range as twenty feet and more. The maple, the ash, the hornbeam, the elm and the birch have yet another method of escape from the home acre. Their seeds are winged, and torn off in a gale are frequently borne two hundred yards away. And stronger wings than these are plied in the cherry-tree's service. The birds bide the time when a blush upon the fruit betrays its ripeness. Then the cherries are greedily devoured, and their seed, preserved from digestion in their stony cases, are borne over hill, dale and river to some islet or brook-side where a sprouting cherry plant will be free from the stifling rivalries suffered by its parent. Yoked in harness with sheep, ox and bird as planter is yonder nimble squirrel. We need not begrudge him the store of nuts he hides. He will forget some of them, he will be prevented by fright or frost from nibbling yet more, and so without intending it he will ensure for others and himself a sure succession of acorns and butternuts.



Bur Parsley Seed ready to steal a ride.

Burdock Seed

Very singular are the seeds that have come to resemble beetles; among these may be mentioned the seeds of the castor-oil plant and of the *Iatropha*. The pod of the *Biserrula* looks like a worm, and a worm half coiled might well have served as a model for the mimicry of the *Scorpiurus vermiculata*. All these are much more likely to enlist the services of birds than if their resemblances to insects were less striking.

Nature elsewhere rich in hints to the gardener and the farmer is not silent here. A lesson plainly taught in all this apparatus for the dispersal of seeds is that the more various the planting the fuller the harvest. Now that from the wheat-fields comes a cry of disappearing gains, it is time to heed the story told in the unbroken prairie that diversity in sowing means wealth in reaping.

### Unbidden Guests, Welcome and Otherwise.

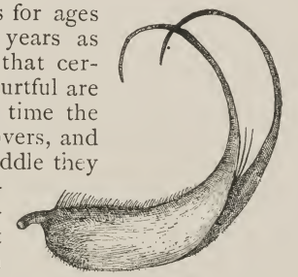
In a field of growing flax we can find—somewhat oftener than the farmer likes—a curious tribe of plants, the dodders. Their stems are thin and wiry, and their small white flowers, globular in shape, make the azure blossoms of the flax all the lovelier by contrast. As their cousins the morning glories are to this day, the dodders in their first estate were true climbers. Even now they begin life in an honest kind of way with roots of their own that go forth as roots should, seeking food where it is to be found in the soil. But if we pull up one of these little club-shaped roots we shall see that it has gone to work feebly and doubtfully; it seems to have a skulking expectation of dinner without having to dig and delve for it in the rough dirty ground. Nor is this expectation unfounded. Watch the stem of a sister dodder as it rises from the earth day by day, and it will be observed to clasp a stalk of flax very tightly; so tightly that its suckers will absorb the juices of its unhappy host. When it can regale itself with food ready to hand so very easily, why should it take the trouble to drudge for a living?

### Pauperism's Degradation.

Like many another pauper demoralized by being fed in idleness, the plant now abandons honest toil, its roots from lack of exercise wither away, and for good and all it ceases to claim any independence whatever. Indeed, so deep is the dodder's degradation that if it cannot find a stem of flax, or hop, or other plant whereon to climb and thieve, it will simply shrivel and die rather than resume habits of industry so long renounced as to be at last forgotten.

Like the lowly dodder the mistletoe is a climber that has discovered large opportunities of theft in ascending the stem of a supporting plant. On this continent the mistletoe scales a wide variety of trees and shrubs, preferring poplars and appletrees, where these are to be had. Its extremely slender stem, its meagre leaves, its small flowers, greenish and leathery, are all eloquent as to the loss of strength and beauty inevitable to a parasite. Rising as this singular plant does out of the branches of another with a distinct life all its own, it is no other than a natural graft, and it is very probable that from the hint it so unmistakably gives the first gardeners were not slow to adopt grafts artificial—among the resources which have most enriched and diversified both flowers and fruits. The dodders and mistletoes rob juices from the stem and branches of their unfortunate hosts; more numerous still are the unbidden guests that fasten themselves upon the roots of their prey. The broom-rape, a comparatively recent immigrant from Europe, lays hold of the roots of thyme in preference to other place of entertainment; the Yellow Rattle, the Lousewort, and many more attach themselves to the roots of grasses—frequently with a serious curtailment of crop.

### Lodgers Generous of Gifts.



Seed of Unicorn Plant, another assisted emigrant

Yet in this very department of hers Nature has for ages hidden away what has been disclosed within twenty years as one of her least suspected marvels. It is no other than that certain parasites of field and meadow so far from being hurtful are well worth cultivating for the good they do. For a long time the men who devoted themselves to the study of peas, beans, clovers, and other plants of the pulse family, were confronted with a riddle they could not solve. These plants all manage to enrich themselves with compounds of nitrogen, which make them particularly valuable as food, and these compounds often exist in a degree far exceeding the rate at which their nitrogen comes out of the soil. And this while they have no direct means of seizing upon the nitrogen contained in its great reservoir—the atmosphere. The mystery was only cleared up by a piece of careful observation. Upon certain roots of beans and peas it was noted that there were little round excrescences about the size of a small pin's head. These excrescences on

examination with a microscope proved to be swarming with bacteria of minute dimensions. Further investigation abundantly showed that these little guests paid a handsome price for their board and lodging—while they subsisted in part on the juices of their host they passed into the bean or pea certain valuable compounds of nitrogen which they built from common air. At the Columbian Exposition last year one of the striking exhibits in the Agricultural Building set this forth in detail. Vials were shown containing these tiny subterranean aids to the farmer, and large photographs showed in natural size the vast increase of crop due to the farmer's taking bacteria into partnership. To-day these little organisms are cultivated of set purpose, and quest is being made for similar bacteria suitable to be harnessed in producing wheat, corn and other harvests.

Is it a bug? No, Only a Seed of Castor Oil Plant.

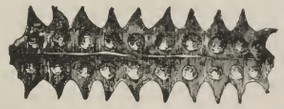
### From Observation to Experiment.

These are times when men of science are discontented with mere observation. They wish to pass from watching things as nature presents them to putting them in relations wholly new. In 1866 DeBary, a close observer of lichens, felt confident that a lichen was not the simple growth it seems, but a combination of fungus and algæ. This opinion, so much opposed to honored tradition, was scouted, but not for long. Before many months had passed Stahl took known algæ, and upon them sowed a known fungus, the result was a known lichen! The fungus turns out to be no other than a slave-driver that captures algæ in colonies and makes them work for him. He is however a slave-driver of an intelligent sort; his captives thrive under his mastery, and increase more rapidly for the healthy exercise he insists that they shall take.

Seed of Scorpiurus vermiculata, mimicing coiled worm.

### The Gardener as Sculptor and Painter.

It is an afternoon in August and the sultry air compels us to take shelter in a grove of swaying maples. Beneath their shade every square yard of ground bears a score of infant trees, very few of them as much as a foot in stature. How vain their expectation of one day enjoying an ample spread of branch and root, of rising to the free sunshine of upper air! The scene, with its quivering rounds of sunlight, seems peace itself, but the seeming is only a mask for war as unrelenting as that of weaponed armies. For every ray of the sunbeam, for every atom of food, for every inch of standing room, there is deadly rivalry. To begin the fight is vastly easier than to maintain it, and not one in a hundred of these bantlings will ever know maturity. We have only to do what Darwin did—count the plants that throng a foot of sod in spring, count them again in summer, and at summer's end, to find how great the inexorable carnage in this unseen combat, how few its survivors. So hard here is the fight for a foothold, for daily bread, that the playfulness inborn in every healthy plant can peep out but timidly and seldom. But when strife is exchanged for peace, when a plant is once safely sheltered behind a garden fence, then the struggles of the battlefield give place to the diversions of the garrison—diversions not infrequently hilarious enough. Now food abounds and superabounds; henceforth neither drought nor deluge can work their evil will; insect foes, as well as may be, are kept at bay; there is room in plenty instead of dismal overcrowding. The grateful plant repays the care bestowed upon it by bursting into a sportiveness unsuspected, and indeed impossible, amidst the alarms and frays incessant in the wilderness. It departs from parental habits in most astonishing fashion, puts forth blossoms of fresh grace of form, of new dyes, of doubled magnitude. The gardener's opportunity has come. He can seize upon such of these "sports" as he chooses and make them the confirmed habits of his wards. Take a stroll through his parterres and greenhouses, where side by side he shows you pansies of myriad tints and the modest little wild violets of kindred to the pansies' ancestral stock. Let him contrast for you roses, asters, tuberous begonias, hollyhocks, dahlias, pelargoniums, before cultivation and since. Were wild flowers clay, were the gardener both painter and sculptor, he could not have wrought marvels more glorious than these. In a few years the brethren of his guild have brought about a revolution for which, if possible at all to her, nature in the open field would ask long centuries. And the gardener's experiments with these strange children of his have all the charm of surprise. No passive chooser is he of "sports" of promise, but an active matchmaker between flowers often brought together from realms as far apart as France and China. Sometimes his experiment is an instant success. Mr. William Paul, a famous creator of splendid flowers, tells us that at a time when climbing roses were either white or yellow, he thought he would like to produce one of bright dark color. Accordingly he mated the Rose Athelin, of vivid crimson, with Russelliana, a hardy climber, and lo, the flower he had imagined and longed for stood revealed! But this hitting the mark at the first shot is uncommon good fortune with the gardener. No experience with primrose or chrysanthemum is long and varied enough to tell him how the crossing of two different stocks will issue. A rose which season after season opposes only indifference to all his pains may be secretly gathering strength for a bound beyond its ancestral paths which will carry it much farther than his hopes, or, perhaps, his wishes.



Pod of Biserrula, masquerading as a grub.

### Possibilities of Experiment.

Most flowers are admired for their own sweet sakes, but who thinks the less of an apple, or a cherry blossom because it bears in its beauty the promise of delicious fruit? Put a red Astrachan beside a sorry crab, a Bartlett pear next a tough, diminutive wild pear such as it is descended from, an ear of milky corn in contrast with an ear one-fourth its size, each grain of which, small and dry, is wrapped in a sheath by itself; and rejoice that fruits and grains as well as flowers can learn new lessons and remember them. At Concord, Massachusetts, in an honored old age, dwells Mr. Ephraim W. Bull. In his garden he delights to show the mother vine of the Concord Grape which he developed from a native Wild Grape planted as long ago as 1843. Another "sport" of great value was the nectarine, which was seized upon as it made its appearance on a peach-bough. Throughout America are scattered Experiment Stations, part of whose business it is to provoke fresh varieties of wheat, or corn, or other useful plant, and make permanent such of them as show special richness of yield; earliness in ripening; stoutness of resistance to Jack Frost, or blight, or insect pests. Suppose that dire disaster swept from off the earth every cereal used as food. Prof. Goodale, Prof. Asa Gray's successor at Harvard University, has so much confidence in the Experiment Stations of America, that he deems them well able to repair the loss we have imagined; within fifty years, he thinks, from plants now uncultivated the task could be accomplished. Among the men who have best served the world by hastening nature's steps in the improvement of flowers and fruits, stands Mr. Vilmorin, of Paris. He it was who in creating

Beetle-like Seed of Iatropha.

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STAG-HORN SUMACH.

RHUS TYPHINA.

JULY—AUGUST.

— 274 —

OAK-LEAVED HYDRANGEA.

HYDRANGEA QUERCIFOLIA.

PLATE 273.

## STAG-HORN SUMACH. RHUS TYPHINA. (CASHEW FAMILY.)

*Shrub, sometimes twenty or thirty feet high; young branches and petioles tomentose-hirsute; leaves pinnate, of numerous leaflets, leaflets oblong-lanceolate, acuminate at apex, sharply serrate, glaucous beneath; flowers small, greenish-yellow, in a dense, thyrsoid panicle; sepals, petals and stamens five; fruit a small, round drupe, bristly with red hairs.*

"What is there sadd'ning in the autumn leaves?
Have they that 'green and yellow melancholy'
That the sweet poet spake of?—Had he seen
Our varigated woods, when first the frost
Turns into beauty all October's wealth—
When the dread fever quits us—when the storms
Of the wild Equinox, with all its wet,
Has left the land as the first deluge left it,
With a bright bow of many colors hung
Upon the forest tops—he had not sighed.
The moon stays longest for the hunter now:
The trees cast down their foliage, and the blithe
And busy squirrel hoards his winter store:
While man enjoys the breeze that sweeps along
The bright blue sky above him, and that bends
Magnificently all the forest's pride,
Or whispers through the evergreens and asks,
'What is there sadd'ning in the autumn leaves?'"

BRAINARD.

THE Sumachs are always handsome plants. Even the common Poison Ivy is a pretty climber with its lush green foliage and bunches of white waxy berries. Our other poisonous species, the Swamp Dogwood, Rhus Veinix, is a beautiful little tree, especially when its foliage has assumed the bright tints of autumn. The Smoke Tree, Rhus Cotinus, so ornamental in fruit, is often seen in parks and on lawns. It is taken as the emblem of "intellectual excellence."

The Stag-horn Sumach is one of the most common American species, especially northward. It is a tall shrub, usually ten or fifteen feet high, but sometimes reaching the height of thirty feet. The stem is covered with fine rusty hair. The leaves are long, made up of many leaflets which are whitened beneath. The flowers, like those of all the Sumachs, are small greenish-yellow in color. It is the fruit, however, that attracts the eye. This is a small berry-like drupe, bright red in color, covered all over with bristly red hairs. The grape-like cluster of these red fruits is very showy in early autumn. With the vivid hues assumed by the foliage, the Stag-horn Sumach is a brilliant bit of color in the fall landscape.

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PLATE 274.

## OAK-LEAVED HYDRANGEA. HYDRANGEA QUERCIFOLIA. (SAXIFRAGE FAMILY.)

*Shrub, three to six feet high; stems slender, branching, bark gray; leaves orbicular or broadly ovate-oblong in outline, deeply three-lobed, the lobes again two or three-lobed, acute, serrate, tomentose beneath, especially when young; flowers in an oblong panicle; corollas of fertile flowers small, of the neutral ones much larger.*

MOST of the beautiful Hydrangeas that are so much prized in cultivation are forms of an Eastern Asiatic species, Hydrangea Hortensis—the "Hydrangea of gardeners." This plant with its handsome varieties is a good illustration of the effects of cultivation. Just as the domestication of animals tends to make them degenerate in many respects, so cultivated plants are apt to lose some of their distinctive vigor. When the end of the gardener's art is the "improvement" of the blossoms, a common result is the loss of fertility. The flowers become larger, showier, handsomer if you will, but the ability to produce seed is diminished or destroyed; there is just so much vitality in a plant, if exhausted in one particular task, other tasks must remain undone. The effect of the culture of the Hydrangea has been to turn the original small corolla into a large neutral blossom without stamens or pistils. As far as there may be beauty in perversion, these massive clusters of pink, blue or greenish-white flowers are very beautiful.

Even native Hydrangeas usually have a few large sterile flowers on the circumference of the cluster of small perfect ones, doubtless as a lure to insects. These are especially well-developed in the superb Hydrangea Quercifolia, often seen in gardens. It is a native of river banks in the Gulf States from Florida to Louisiana.

Hydrangea is from two Greek words signifying "water" and "vase," referring to the shape of its capsules.

— 275 —

CRANE-FLY ORCHIS.

TIPULARIA UNIFOLIA (DISCOLOR).

JUNE—JULY.

— 276 —

DISPORUM MACULATUM.

(LILY FAMILY.)

MAY.

PLATE 275.

## CRANE-FLY ORCHIS. TIPULARIA UNIFOLIA (DISCOLOR). (ORCHIS FAMILY.)

*Stem smooth, brownish, erect from a large corm; leafless or with a few scales near the base; leaf solitary, radical, rather long-petioled, ovate, many-nerved; inflorescence a long terminal raceme; flowers small, brownish; perianth segments linear, spreading; lip bearing a slender spur, more than twice as long as the flower.*

"By fate, not option, frugal Nature gave
One scent to hyson and to wall-flower,
One sound to pine-groves and to water-falls,
One aspect to the desert and the lake.
It was her stern necessity; all things
Are of one pattern made; bird, beast, and flower,
Song, picture, form, space, thought, and character
Deceive us, seeming to be many things,
And are but one."

EMERSON.

MIMICRY by Orchids of insects of the most widely different families has been remarked since these plants were first studied. Whether these wonderful resemblances are always purely accidental, is an unanswered question. Is it not at least possible that the flowers of different plants may attract insects by assuming the hues and forms by means of which one individual insect of a species is enabled to recognize its mates? The narrow strap-shaped sepals are often strikingly like the antennæ of insects, while the broader petals or lip answer for wings.

Tipularia Unifolia is one of the best specimens of this mimicry of insects on the part of Orchid-blossoms. The long spur and narrow sepals make a fair imitation of the body and wings of a Crane-fly. It is to this resemblance that the plant owes both its English and Latin names. Tipularia is from Tipula, the Crane-fly. In this case the imitation is doubtless accidental, as no one attributes to the Crane-fly or any allied insect the cross-fertilization of Tipularia.

The Crane-fly Orchis is one of the most difficult to find of our Orchids. It grows in deep rich woods, and its dead brown color is so similar to that of the withered leaves with which the ground is strewn, that its detection is a task for the sharpest eyes.

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PLATE 276.

## DISPORUM MACULATUM. (LILY FAMILY.)

*Herbaceous perennial; roots clustered, fibrous, from a knotty rootstock; stem erect, forking; leaves alternate, clasping, ovate, acuminate, downy pubescent, especially when young, veiny; flowers one to three on slender, drooping terminal peduncles; perianth, divisions six, white, spotted with purple; fruit an ovoid, several seeded, red berry.*

SPOTTED flowers seem to be a family trait of the Lilies. The marvelous markings of the petals of the species of Calochortus, those beautiful herbs of which the Mariposa Lily is the best known, are extreme developments of this common tendency. The purple or brown dots on the flower-leaves of most Lilies, and the less distinct bars and checkerings of the Fritillarias, are more familiar instances.

None of the Lilies have more beautifully marked blossoms than the little known Disporum Maculatum, a native of wooded bluffs along the rivers in the Cumberland and Alleghany mountains, and ranging northward. An elegant plant is this Disporum, well worthy a place in every garden. The leafage is of a bright tender green. The blossoms, very broad and open bell-shaped in form, droop from their slender stalks at the summit of the stems. The six petals, wide apart and tapering into slender claws, are almost pure white, thick dotted with crimson-purple. When these have fallen the plant puts on new beauty, in late summer; having won the admiration of insects it now seeks that of the birds. The fruit is more showy than the blossom—a small egg-shaped berry, bright scarlet in color. It blossoms, to quote Lowell:

"When oaken woods with buds are pink,
And new-come birds each morning sing,
When fickle May on Summer's brink
Pauses and knows not which to fling,
Whether fresh bud and bloom again,
Or hoar-frost silvering hill and plain.

When from the honeysuckle gray
The oriole with experienced quest
Twitches the fibrous bark away,
The cordage of his hammock nest,
Cheering his labor with a note
Rich as the orange of his throat."

— 277 —

FALSE IPECAC.

RICHARDSONIA SCABRA.

— 278 —

BLADDERWORT.

UTRICULARIA INFLATA.

JUNE.

PLATE 277.

## FALSE IPECAC. RICHARDSONIA SCABRA. (MADDER FAMILY.)

*Annual, hirsute pubescent; stem decumbent or ascending; dichotomously branched; leaves ovate or obovate, acute, short-petioled, uppermost pairs united at base, into an involucre about the flower-clusters; flowers densely glomerate, calyx four to seven-lobed; corolla funnel-formed, three to six-lobed, white or pinkish, fruit two or three nutlets.*

SOME families of plants are easily recognized as families—all the members resemble each other obviously. The Cress Family, for instance, is plainly of one mold and pattern. So is the Umbellifer Family. The Madder Family on the other hand, is made up of several tribes that are apparently more distinct than some families. Yet a study of the parts of the flowers bring out their relationship clearly. No one would suppose that the climber with showy scarlet and yellow flowers familiar in cultivation, the Manettia, is a relative of the homely, weak-stemmed Bedstraws, or of the noble Cinchonas. In tracing back the tips of branches to the trunk of the tree of life, the botanist often finds a flower's "long lost brother" where the ordinary observer would never suspect even remote kinship.

Belonging to the tribe of the Bedstraws, is the rather homely and weed-like Richardsonia, sometimes known as False Ipecac. This is a rough little plant, covered all over with bristly hairs. The tiny whitish flowers are densely clustered at the summit of the stems, protected by the uppermost pair of leaves, which are united at base into a sort of cup.

Richardsonia Scabra is a native of tropical America, sometimes straying northward. It is somewhat sparingly introduced into the South Atlantic and Gulf States. In some localities it is known to the people as "Mexican Clover," as cattle are fond of it.

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PLATE 278.

## BLADDERWORT. UTRICULARIA INFLATA. (BLADDERWORT FAMILY.)

*Aquatic; lower leaves submersed, much dissected into fine, capillary divisions, these bearing small, round bladders; uppermost leaves in a whorl, floating by means of the large, distended petioles; flowers in a simple bracted raceme terminating the long scape, large, irregular; corolla with a conspicuous spur.*

WRITING on the eleventh of June, 1852, Thoreau records the finding of "Utricularia Vulgaris, common Bladderwort, a dirty-conditioned flower, like a slovenly woman with a gaudy yellow bonnet." Evidently the anchorite of Walden did not admire the common Bladderwort, which is uncleanly simply because its home is foul. Had he known the Utricularia Inflata we should doubtless have had a prettier description.

A more remarkable plant than this 'twould be difficult to find among our wild flowers. The long slender stem, rooting in the mud at the bottom of ponds, bears numerous leaves that are entirely submersed in the water. These are dissected into delicate thread-like divisions that bear many tiny bladders, whence the name, Utricularia. Above these, resting on the surface of the water, is a raft-like circle of leaves, supported by their inflated stalks. Borne aloft above these last leaves is a stalk with a few large bright yellow flowers. Very odd and irregular blossoms these are, and very showy.

Utricularia Inflata is found in stagnant pools along the Atlantic and Gulf coast, from the Maritime Provinces of Canada to Texas, blossoming all summer. The tiny bladders that cover the submersed leaves are furnished with valves which admit prey—for be it known that the Bladderwort is one of the many plants that have turned the tables on the animal creation, and are not food, but eaters.

— 279 —

PURPLISH HORKELIA.

HORKELIA PURPURASCENS.

— 280 —

FALSE SOLOMON'S SEAL.

VAGNERA (SMILACINA) RACEMOSA.

JUNE.

**PLATE 279.**

## PURPLISH HORKELIA. HORKELIA PURPURASCENS. (ROSE FAMILY.)

*Perennial herb; stem low, pubescent, leafy; leaves pinnate, the leaflets two to four-parted; flowers few in a cymose cluster, subtended by small bractlets; calyx purplish, longer than the corolla; petals five, broad, wedge-shaped, purple; stamens numerous.*

"The loveliest flowers the closest cling to earth,
And they first feel the sun: so violets blue;
So the soft star-like primrose drenched in dew—
The happiest of Spring's happy, fragrant birth.
To gentlest touches sweetest tones reply,
Still humbleness with her low-breathed voice
Can steal o'er man's proud heart, and win his choice
From earth to heaven, with mightier witchery
Than eloquence or wisdom e'er could own.
Bloom on then in your shade, contented bloom,
Sweet flowers, nor deem yourselves to all unknown—
Heaven knows you, by whose gales and dews ye thrive;
They know, who one day for their altered doom
Shall thank you, taught by you to abase themselves and live."—JOHN KEBLE.

EXCEEDINGLY pretty and odd is this native of California. It was discovered by Dr. Rothrock in the Sierra Nevada Mountains, growing at an altitude of nine thousand feet. The original locality was near the headwaters of Kern River. It is a low herbaceous plant, not above six inches high. The leaves are compound, of many leaflets. Soft silky hairs cover the stem and leaves. The flowers are of a handsome rose-purple color, in a small, open cluster. The stamens with their bright yellow anthers are very numerous. An odd thing about them is that those that are opposite the sepals have filaments broader at base and tapering toward the apex, while those opposite the petals are thread-shaped. The fruit consists of a number of dry carpels like the "seeds" that cover the flesh of the Strawberry, but the receptacle on which they are borne does not become enlarged and soft as in that delicious fruit. Albeit, the genus Fragaria to which the Strawberries belong, is nearly allied to Horkelia.

Horkelia was named by Chamisso and his collaborator Schlechtendal, who assisted him in working up the collections he made on his voyage in the Pacific, in honor of Johann Horkel, professor of physiology at Berlin. Some botanists unite Horkelia with Potentilla. This pretty flower strays North and may have reached British Columbia.

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**PLATE 280.**

## FALSE SOLOMON'S SEAL. VAGNERA (SMILACINA) RACEMOSA. (LILY FAMILY.)

*Stem erect from a fleshy rootstock, somewhat flexuose, leafy, puberulent or nearly smooth; leaves alternate, subsessile, ovate-lanceolate, acuminate, downy beneath; flowers small, white, in a terminal panicle; perianth wheel-shaped, six-parted; stamens six, inserted on the perianth; fruit a berry, globular, two-seeded.*

"Where leafy shades fence off the blustering gale,
And breathes in peace the lily of the vale."—WORDSWORTH.

IN just such places as the Lily-of-the-valley loves, its handsome cousin, the False Solomon's Seal, is found. In rich woods, either low woods or on sheltered hillsides, this pretty wild flower may be found. It is extensively distributed in North America, ranging from Canada to South Carolina and westward to Kansas and Arkansas. In May in the South, in the Northern latitudes in June, the terminal panicle unfolds, and the small white blossoms open one by one. Delicate little flowers they are, pretty individually and showy in cluster. The whole plant is elegant in its habit. The stem, rising from a rather long, fleshy, white rootstock, is leafy to the top. The leaves are lily-like, on very short stalks. In late summer they are often discolored by a fungus, a Septoria, which causes them to become streaked with brown in an odd fashion. The berries are very pretty, bright red or sometimes pale red speckled with darker color.

The habit and leaves of the plant are much like those of the Solomon's Seal, hence the popular name. False Spikenard is another name for Vagnera Racemosa, probably because of the resemblance of the flowers to those of the Spikenard, Aralia Racemosa.

**PLATE 281.**

## HOG WEED. AMBROSIA ARTEMISIÆFOLIA. (SUNFLOWER FAMILY.)

*Hairy; stem erect, much branched, leafy; leaves alternate, slender petioled, once or twice pinnatifid, uppermost nearly entire; flowers small in unisexual heads, the sterile ones in slender, terminal racemes, the fertile solitary in the axils of the upper leaves, subtended by a nearly closed top-shaped involucre.*

AS a rule, our most harmful weeds are natives of the Old World. Our own weeds usually confine themselves with due modesty to fence rows, river banks and sterile fields, not overrunning cultivated ground. Perhaps this more predatory habit on the part of the weeds of Europe is to be accounted for by the fact that at home they have been accustomed to grow with cultivated plants for thousands of years. The Charlock and the Cockle are scarcely seen in Europe outside of grain fields. And that because there is comparatively little untilled soil for them to inhabit. In the New World the conditions are different. Here the weeds have an unlimited stamping ground. Cultivated ground is the rare exception, rather than the rule, in most parts of this continent.

So the Rag-weeds, though usually termed weeds, hardly come under the definition. The Great Rag-weed finds a comfortable home on the banks of rivers and creeks, while the common Hog Weed is content with the poorest soil. In such locations it is abundant. The yellow pollen that both species produce so copiously in August and September is peculiarly annoying to hay fever patients.

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**PLATE 282.**

## POKE WEED. PHYTOLACCA DECANDRA. (POKE WEED FAMILY.)

*Stem tall, widely branching, succulent, often purplish; leaves alternate, petioled, ovate, acute at both ends, entire, quite smooth; flowers in simple racemes, terminal at first but becoming lateral by the development of axillary shoots, apetalous; sepals five, white, concave; fruit a purple-black, depressed berry.*

"What mean these banners spread,
These paths with royal red
So gaily carpeted?
Comes there a prince to-day?
Such footing were too fine
For feet less argentine
Than Dian's own or thine,
Queen whom my tides obey."—LOWELL.

REFLECTING upon the conspicuousness of red color in the autumn landscape, Thoreau takes the Poke Weed as an illustration:

"Some which stand upon our cliffs quite dazzle me with their purple stems now and early in September. Every part is flower, (or fruit,) such is its superfluity of color, stem, branch, peduncle, pedicel, petiole, and even the at length yellowish purple veined leaves. Its cylindrical racemes of berries of various hues, from green to dark purple, six or seven inches long, are gracefully drooping on all sides, offering repasts to the birds; and even the sepals from which the birds have picked the berries are a brilliant lake red, with crimson, flame-like reflections, equal to anything of the kind—all on fire with ripeness."

Few plants have been better described. And the Poke Weed, plebeian of the wayside as it is, deserves all Thoreau's praise. There is a richness, a very abandon of color and life about it. From the thick sappy stems to the luscious, purple-blooded berries, it is abounding in health, vitality. Phytolacca is a common plant throughout the greater part of the United States and Canada. It blossoms from July until the end of summer. The succulent young shoots are sometimes used as a pot-herb.

— 281 —

HOG WEED.

AMBROSIA ARTEMISIÆFOLIA.

AUGUST.

— 282 —

POKE WEED.

PHYTOLACCA DECANDRA.

JULY.

**PLATE 283.**

## LARKSPUR. DELPHINIUM AJACIS. (CROWFOOT FAMILY.)

*Stem rather tall, simple or nearly so, leafy; leaves alternate, finely dissected into filiform divisions; flowers in terminal, crowded, spike-like racemes, showy, white or pink; sepals five, colored like the petals, the upper one produced into a spur; petals four, the two upper prolonged into spurs that project into the calyx spur.*

THE Larkspur is an important symbol in the Language of Flowers. In general it signifies levity, perhaps by conceiving the qualities of the lark as transferred to the Larkspur. For, does not that merry songster of the Old World scorn the prosaic fields, and delight in soaring up into the dizzy heights of air? Perhaps, again, there is an alert and "ready-to-fly" look about the Larkspur flowers themselves. The Purple Larkspur, Delphinium Consolida, conveys the idea of haughtiness, while the Pink Larkspur, the Delphinium Ajacis, is the token of fickleness.

The flowers of the Crowfoot Family, usually so regular, as in Clematis and Buttercup, are sometimes oddly fashioned. The Columbine, for example, and the Aconite, have quaintly-built blossoms—each and all, that they may be counterparts to their winged ministers. None of them is more striking in this respect than Delphinium. Its long spur to one of the sepals, which encloses the shorter spurs into which two of the petals are prolonged, contains the honey which attracts its unwitting partners of the air. Delphinium is from the classical name of the "Dolphin," from a fancied resemblance in the flowers to the head of that strange fish.

Delphinium Ajacis is a European plant, sparingly naturalized in northeasterly regions of America.

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**PLATE 284.**

## ELM-LEAVED GOLDEN-ROD. SOLIDAGO ULMIFOLIA. (SUNFLOWER FAMILY.)

*Stem erect, rather tall, smooth; leaves thin, elliptical or ovate-lanceolate; acute at apex and narrowed at base, coarsely serrate, only the mid-vein prominent, uppermost very small; clusters of heads in one-sided racemes, forming a terminal open panicle; heads small, few-flowered; involucre-scales linear; rays four or five.*

"Graceful, tossing plume of glowing gold,
Waving lonely on the rocky ledge;
Leaning seaward, lovely to behold,
Clinging to the high cliff's ragged edge;

"Burning in the pure September sky,
Spike of gold against the stainless blue,
Do you watch the vessels drifting by?
Does the quiet day seem long to you?

"Matters not to you, O golden flower!
That such eyes of worship watch you sway?
But you make more sweet the dreamful hour,
And you crown for me the tranquil day."—CELIA THAXTER.

UBIQUITOUS are the Golden-rods in North America! Every climate, every soil, every altitude, has its species. Some love the hot sands along the Gulf Coast. Others flourish in the swamps that border the Atlantic. Several species are peculiar to the Alleghany and Blue Ridge Mountains. The great plains of the West are gay in autumn with their characteristic kinds. The naked crags of the Rockies give shelter to some dwarf Solidagos. Others are found only on the Pacific Slope. A Carolina species begins to blossom in May, while many are yet in flower when the first frost comes.

Solidago Ulmifolia is a not uncommon species in eastern and north-eastern regions of the continent, growing in thickets and the borders of low woods. It is a tall-stemmed species, with the heads arranged one-sided on the long, curved branches.

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LARKSPUR.

DELPHINIUM AJACIS.

JULY.

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ELM-LEAVED GOLDEN-ROD.

SOLIDAGO ULMIFOLIA.

AUGUST.

PLATE 285.

## WILD PEPPERGRASS. LEPIDIUM VIRGINICUM. (CRESS FAMILY.)

*Annual; stem erect, branching, leafy, glabrous or slightly pubescent; leaves alternate, tapering into a short petiole, root-leaves lyrate-pinnatifid, cauline undivided, sharply serrate, ovate-lanceolate to narrowly linear; flowers small, greenish, slender-pedicelled, in terminal racemes; silicle small, flat, orbicular in outline, marginless.*

E are all familiar with the Peppergrass, that small weed so common in fields and roadsides. Its first tiny white green blossoms open with the flowers of May. The Golden-rods and Asters find it still in flower. Often it perseveres until the first frost of autumn cuts short its career. It comes early and stays late, ripening many minute seeds and spreading ever farther afield. The Peppergrass is said to be an emigrant from the Southern States. If so, it has made itself well at home northward. The whole plant has the pleasantly pungent taste so common in the family to which it belongs; and to this peppery flavor it owes its name. The root especially abounds in the acrid oil which is so pleasing to the palate in Mustard, Horse-radish and Cress.

The Peppergrass somewhat resembles in appearance its cousin the Shepherd's Purse. Like the latter, it flowers through a great part of the year. It may be easily distinguished, however, by its more bushy growth, and its rounded, rather than triangular, seed-pods.

Lepidium, the botanical name of the Peppergrass, is from a Greek word signifying "a small scale." There are many species in the West.

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PLATE 286.

## LAMB'S QUARTERS. CHENOPODIUM ALBUM. (GOOSEFOOT FAMILY.)

*Stem erect, much branched, one to six feet high, striate, glabrous but usually "mealy" granular; leaves on long slender petioles, lower rhombic-ovate and angular-lobed or toothed, uppermost linear, entire, glaucous; flowers small, greenish, perfect, in panicled spikes; calyx five-lobed, lobes carinate.*

CARCELY any plant is more commonplace in external appearance than the "Lamb's Quarters." This homely weed of waste-ground and field, at home in the vacant lot, in the crowded city and by the side of the quiet country road, seems the embodiment of all that is sordid and uninteresting. Yet even the outer part of the plant is not unbeautiful to the trained eye. Beauty is not for all. It is revealed to those who know how to look for it. One needs not to know *where*, for it is everywhere. Without the microscope and without any knowledge of botany, one may learn to find loveliness in Horse-weed or Mullein. With the microscope, and knowing something of botany, each despised weed becomes a treasure-house—with an architecture admirable because fitting, unwasteful and uncopied.

Few plants possess more that is interesting than the Chenopodiums, of which the Lamb's Quarters is one. The small seeds, usually flattened and with a brown or black shining crust, are things of beauty when examined. Nothing in the vegetable world is more exquisite than the tiny coiled embryo that looks like thread wound spirally.

Chenopodium Album is now thoroughly distributed over a great part of North America. It flowers in late summer.

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WILD PEPPERGRASS.

LEPEDIUM VIRGINICUM.

MAY—SEPT.

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LAMB'S-QUARTERS.

CHENOPODIUM ALBUM.

JUNE—JULY.

PLATE 287.

## CLINTONIA. CLINTONIA BOREALIS. (LILY FAMILY.)

*Perennial; rootstock short, thick, toothed, stem short; leaves clustered at base, usually three or four, oblong or obovate, short-pointed, margin ciliate; flowers few, in a terminal umbel, large, open campanulate; sepals six, greenish, lanceolate, spreading; fruit an egg-shaped, dark blue berry.*

CLINTONIA Borealis, the *Northern Clintonia*, is an inhabitant of bogs and cool mountain woods in the eastern part of the continent, ranging from Labrador southward, chiefly along the Appalachians, to the Carolinas, and westward through Eastern Canada and the Northern States to Minnesota. It is a fine plant, with handsome leaves, greenish yellow blossoms and dark blue berries in late summer. Its flowering time is May and June.

Thoreau has a pretty account of it:

"Its beauty at present consists chiefly in its commonly three very handsome, rich, clear, dark green leaves, which Bigelow describes truly as 'more than a half a foot long, oblanceolate, smooth, and shining.' They are perfect in form and color, broadly oblanceolate, with a deep channel down the middle, uninjured by insects, arching over from a centre at the ground. * * * In fact, the plant is all green, both leaves and corolla. The leaves alone—and many have no scape—would detain the walker. Its berries are its flower. A single plant is a great ornament in a vase, from the beauty of its form and the rich, unspotted green of its leaves."

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PLATE 288.

## GREEN REIN-ORCHIS. HABENARIA BRACTEATA. (ORCHIS FAMILY.)

*Stem smooth, erect from a cluster of thickened, fibrous roots, leafy; leaves alternate, obovate, uppermost lanceolate and bract-like; flowers in a terminal raceme, much exceeded by the bracts; greenish; spur short, lip narrow, three-lobed; pollen masses attached to conspicuous viscid glands.*

THERE is a peculiar pleasure in finding rare things, even though they be not intrinsically beautiful or interesting. We prize a little-known plant, simply because it is rare and little-known. Describing his first sight of the rose-breasted Gross-beak, Thoreau writes exultingly:

"Birds answer to flowers, both in their abundance and their rareness. The meeting with a rare and beautiful bird like this is like meeting with some rare and beautiful flower, which you may never find again, perchance."

The Orchid Family is pre-eminently one of rare plants. Many of our most retiring wild flowers which we may hope to find only by forcing our way through deep woods or into almost impenetrable bogs, are Orchids. Such is the beautiful Calypso, one of the least-known and most beautiful of flowers. It seems odd at first that these plants should not be common, they produce such enormous quantities of seed. Shake the ripe pod of a Coral-root or Lady's Slipper and out falls what looks like a shower of sawdust. Every atom is a seed. Perhaps when seeds are produced in such quantity, only a few in each pod are fertile.

Many orchids that cannot be called beautiful are attractive on account of their rarity. Such is the Green Rein-Orchis, Habenaria Bracteata, which occurs sparingly throughout North America, east of Dakota and north of Georgia.

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CLINTONIA.

CLINTONIA BOREALIS.

JUNE—AUGUST.

— 288 —

GREEN-REIN ORCHIS.

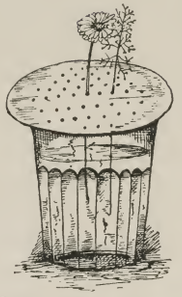
HABENARIA BRACTEATA.

JUNE.

the sugar beet laid the foundation for one of the chief industries of our time. One of his rules is to select at first not the plant which varies most in the direction he wishes, but the plant that varies most in any direction whatever. From it, from the instability in its very fibres, its utter forgetfulness of ancestral traditions, he finds it easiest in the long run to obtain and to establish the character he seeks of sweetness, or size, or color.

### Much Can Be Done.

Of flowering plants there are about 110,000, of these the farmer and the gardener between them have scarcely tamed and trained 1000. What new riches, therefore, may we not expect from the culture of the future? Already in certain northern flower-plots the trillium, the blood-root, the dog's-tooth violet, and the celandine are abloom in May; as June advances, the wild violet, the milkweed, the wild lily-of-the-valley, unfold their petals; later in summer the dog-rose displays its charms and breathes its perfume. All respond kindly to care, and were there more of this hospitality, were the wild-roses which the botanists call *blanda* and *lucida*, were the cardinal-flowers, the May-flowers, and many more of the treasures of glen and meadow, made welcome with thoughtful study of their wants and habits, much would done to extend the wealth of our gardens. Let a hepatica be plucked from its home in a rocky crevice where one marvels how it ever contrived to root itself and find subsistence. Transplant it to good soil, give it a little care—it asks none—and it will thrive as it never throve before; proving once again that plants do not grow where they like, but where they can. The Russian columbine rewards its cultivator with a wealth of blossoms that plainly say how much it rejoices in his nurture of it, in its escape from the frost and tempest that have assailed it for so many generations.



Perforated Stalk Holder.

But here we must be content to take a leaf out of nature's book, and look for small results unless our experiments are broadly planned. It is in great nurseries, and gardens, not in little door-yards that "sports" are likely to arise, and to meet the skill which can confirm them as new varieties.

Dr. William Seward Webb, of New York, has a mansion surrounded by spacious grounds at Shelburne, on the shores of Lake Champlain, seven miles from Burlington, Vermont. It is his intention next summer to adorn his grounds exclusively with wild flowers. Much interest attaches to the experiment, for the district, bordering as it does upon the Adirondacks, is florally one of the richest in America.

Japan has much to teach us with regard to flowers: nowhere else on earth are they so sedulously cultivated, or so faithfully studied in all their changeful beauty. Perhaps the most striking revelation of the Japanese gardener is his treatment of flowering shrubs and flowering trees disposed in masses. Happy the visitor to Tokio who sees in Spring time the cherry-blossoms ready to lend their witchery to the Empress' reception! Much is done to extend the reign of beauty in a garden when it is fitly bordered with berry-bearers. Rows of mountain ash, snow-berry and hawthorn trees give color just when color is most effective, at the time when most flowers are past and gone.

Plant Case.

In the practical bit of ground where the kitchen garden meets the flowers, Japan has long since enlarged its bill of fare with the tuber of a cousin of our common hedge nettle, with the roots of the large burdock, commoner still. In Florida, the calla lily has use as well as beauty; it is cultivated for its potato-like tubers.

### Flowers Gathered and Garnered.

Much as the study of flowers heightens our interest in them, their first, their chief, enduring charm consists in their simple beauty—their infinitely varied grace of form, their exhaustless wealth of changeful tints. Off we go with delight from desk and book to a breezy field, a wimpling brook, a quiet pond in woodland shade. A dozen rambles from May to October will show us all the floral procession, which, beginning with the trilliums and the violets, ends at the approach of frost with the golden-rod and aster. But who ever formed an engaging acquaintance without wishing it might become a close friendship? Never yet did the observant culler of bloodroot and columbine rest satisfied with merely knowing their names, and how can more be known unless flowers are set up in a portrait gallery of their own for the leisurely study of their lineaments and lineage?

A word then as to the best way to gather wild flowers. A case for them in the form of a round tube, closed at the ends, with a hinged cover, can be made by a tinsmith at small cost. Its dimensions should be about 30 inches in length by 5 inches in diameter, with a strap attached to carry it by. At still less expense a frame can be made, or bought, formed of two boards one-eighth of an inch thick, 24 inches long and 18 inches broad, with two thin battens fastened across them to prevent warping. A quire of soft brown paper, newspaper will do, and a strap to hold all together, complete the outfit.

Our gathered treasures at home, we may wish to deck a table or a mantel with a few of them. The lives of unpressed blossoms can be much prolonged by exercising a little care. Punch holes in a round of cardboard and put the stalks through these holes before placing the flowers in a vase. This prevents the stalks touching each other, and so decaying before their time. A small bit of charcoal in the water tends to keep it pure; the water, however, should be changed daily.

### Flower Portraiture.

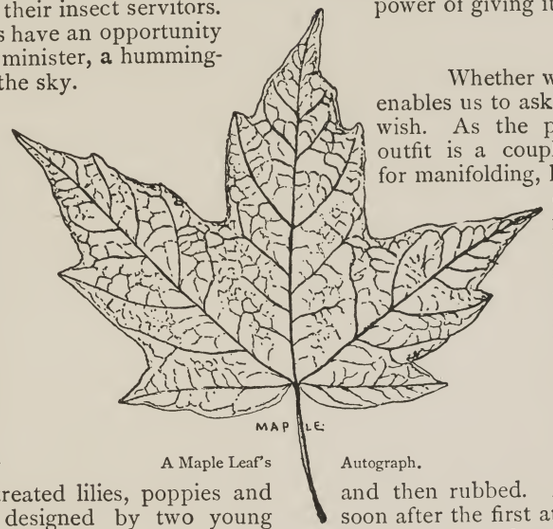
A flower will fade at last be it tended ever so carefully. If we wish to preserve it dried we can best do so as soon as we bring it home, by placing it between sheets of absorbent paper (newspaper will do) well weighted down, the paper to be renewed if the plants are succulent and if there is any risk of mildew. But a dried plant after all is only a mummy. Its colors are gone; its form bruised and crumpled, gives only a faint suggestion of it as it lived and breathed. Other and more pleasant reminders of our summer rambles can be ours. With a camera of fair size it is easy to take pictures of flowers at their best; these pictures can be colored in their natural tints with happy effect. Or, instead of the camera, why not at first invoke the brush and color-box? Only a little skill in handling them is enough for a beginning. Practice soon increases deftness in this art as in every other, and in a few short weeks floral portraits are painted with a truth to nature denied the unaided pencil. For what flower however meek and lowly could ever tell its story in plain black and white?

The amateur painter of flowers learns a good many things by the way; at the very outset, that drawing accurate and clear must be the groundwork of any painting worthy the name. Both in the use of pencil and brush there must be a degree of painstaking observation, wholesome as a discipline and delightful in its harvests. How many of us, unused to the task of careful observation, can tell the number of the musk-mallow's petals, or mark on paper the depth of fringe on a gentian, or match

from a series of dyed silks the hues of a common buttercup? Drawing and painting sharpen the eye, and make the fingers its trained and ready servants. From the very beginning of one's tasks in limning bud and blossom, we see them richer in grace and loveliness than ever before. When wild flowers are sketched as they grow it is often easy to give them a new interest by adding the portraits of their insect servitors. Amateurs who are so fortunate as to visit the West Indies have an opportunity to paint the wonderful blossoms of the Marcgravia, whose minister, a humming-bird, quivers above it like a bit of rainbow loosened from the sky.

### Flowers In Design.

Early in the history of art the wild flowers lent their aid to decoration. The acanthus which gave its leaves to crest the capital of the Corinthian column, the roses conventionalized in the rich fabrics of ancient Persia, until they have been thought sheer inventions of the weaver, are among the first items of an indebtedness which has steadily grown in volume until to-day, when the designers who find their inspiration in the flowers are a vast and increasing host. In a modern mansion of the best type the outer walls are enriched with the leonine beauty of the sun-flower; within, the mosaic floors, the silk and paper hangings, repeat themes suggested by the vine, the wild clematis and the May-flower. The stained-glass windows, from New York, where their manufacture excels that of any other city in the world, are exquisite with boldly treated lilies, poppies and columbines. In the drawing-room are embroideries designed by two young women of Salem, Massachusetts, who have established a thriving industry in transferring the glow of wild flowers to the adornments of noble houses such as this.




A Maple Leaf's Autograph.

As one goes from studio to studio it is cheering to find so many men and women busy at work which is more joyful than play,—which in many cases first taken up as recreation disclosed a vein of genuine talent and so pointed to a career more delightful than any other,—because it chimes in with the love of beauty and the power of giving it worthy expression.

### Nature-prints of Leaves.

Whether we have the gift of art or not, a very pretty and simple process enables us to ask and receive from Nature as many of her autographs as we wish. As the process is new, let it be described with a little detail. The outfit is a couple of sheets of fresh carbon paper such as stationers sell for manifolding, half a dozen sheets of thin linen paper, and as much cartridge, or other paper, smooth in surface. The leaves for printing must be green, and neither wet nor dry. One of them, say a maple leaf, is laid rib side down on a sheet of carbon paper, and is then covered with a sheet of linen paper through which the outline of the leaf can be both seen and felt. A piece of soft cotton, or an old silk handkerchief, is now rubbed on the leaf, gently if the leaf is tender, with some pressure if the leaf is strong: the finger-tips moving outward from the mid-rib to the edges of the leaf. As soon as the leaf has gathered carbon enough it is lifted and placed, carbon side down, on the cartridge paper which is to receive its imprint. To make this imprint, the leaf is covered with a sheet of linen paper and then rubbed. A clear and beautiful image will reward one's pains very soon after the first attempt. With but a little practice an extremely pretty album can be made from leaves of every type, a touch from a pencil here and there filling in unavoidable short breaks of line.

GEORGE ILES.

# INDEX TO PLATES.

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